In the claims:

Claims 1-18 (canceled)

19. (New) A microlithographic projection lens having a system diaphragm arranged in a region of a last bulge on an image side, and having an image-side numerical aperture of more than 0.65 and an image field diameter of more than 20 mm, wherein a pupil plane is curved over a cross section of a pencil of rays by a maximum of 20 mm, wherein a lens group of negative refractive power is arranged at each waist, and a lens group of positive refractive power is arranged at each bulge, and, wherein at least three positive lenses of the lens group of the third bulge are arranged before the pupil plane.

20. (New) The projection lens according to claim 19, wherein a first negative lens that follows the pupil plane in a beam path is a meniscus that is concave on a pupil side.

21. (New) The projection lens according to claim 19, wherein at least one spherically overcorrecting air space is arranged between adjacent lenses in a region of a third bulge behind the pupil plane.

22. (New) The projection lens according to claim 19, wherein a lens with an aspheric surface is arranged before a first waist.

23. (New) The projection lens according to claim 19, wherein a second waist comprises only spherical lenses.

24. (New) The projection lens according to claim 19, wherein quartz glass and fluoride crystals, individually or in combination, are used as lens material.

25. (New) The projection lens according to claim 19, wherein the crystals comprise any of CaF_2, BaF_2, SrF_2, LiF.

26. (New) The projection lens according to claim 19, comprising two waists and three bulges.

27. (New) A microlithographic projection exposure device comprising a projection lens according to claim 19.

28. (New) A process for producing microstructured components, comprising the steps of:

exposing a substrate provided with a photosensitive layer with ultraviolet light via a mask and a projection exposure device according to claim19, and

if necessary, after development of the photosensitive layer, the substrate is structured corresponding to a pattern contained on the mask.

29. (New) The process according to claim 28, comprising several exposures with at least one of different kinds of illumination and numerical apertures.

30. (New) The microlithographic projection lens having a system diaphragm arranged in a region of a last bulge on an image side, and having an image-side numerical aperture of more than 0.65 and an image field diameter of more than 20 mm, wherein the lens has a telecentricity deviation of less than ± 4 mrad of a geometric central beam, on stopping down to 0.8 times said image-side numerical aperture, wherein a lens group of negative refractive power is arranged at each waist, and a lens group of positive refractive power is arranged at each bulge, and wherein at least three positive lenses of the lens group of the third bulge are arranged before the pupil plane.

31. (New) A microlithographic projection lens according to claim 30, wherein said telecentricity deviation is less than $\pm$ 3 mrad.

32. (New) A microlithographic projection lens according to claim 30, wherein a first negative lens that follows the pupil plane in a beam path is a meniscus that is concave on a pupil side.

33. (New) A microlithographic projection lens according to claim 30, wherein at least one spherically overcorrecting air space is arranged between adjacent lenses in a region of a third bulge behind the pupil plane.

34. (New) A microlithographic projection lens according to claim 30, wherein a lens with an aspheric surface is arranged before a first waist.

35. (New) A microlithographic projection lens according to claim 30, wherein a second waist comprises only spherical lenses.

36. (New) A microlithographic projection lens according to claim 30, wherein quartz glass and fluoride crystals, individually or in combination, are used as lens material.

37. (New) A microlithographic projection lens according to claim 30, wherein the crystals comprise any of CaF_2, BaF_2, SrF_2, LiF.

38. (New) A microlithographic projection lens according to claim 30, comprising two waists and three bulges.

39. (New) A microlithographic projection exposure device comprising a projection lens according to claim 30.

40. (New) A process for producing microstructured components, comprising the steps of:

exposing a substrate provided with a photosensitive layer with ultraviolet light via a mask and a projection exposure device according to claim 30, and

if necessary, after development of the photosensitive layer, the substrate is structured corresponding to a pattern contained on the mask.

41. (New) The process according to claim 40 comprising several exposures with at least one of different kinds of illumination and numerical apertures.

42. (New) A microlithographic projection lens having a system diaphragm arranged in a region of a last bulge on an image side, and having an image-side numerical aperture of more than 0.65 and an image field diameter of more than 20 mm, wherein a tangential image dishing of a pupil image in a diaphragm space is corrected to less than 20 mm, wherein a lens group of negative refractive power is arranged at each waist, and a lens group of positive refractive power is arranged at each bulge, and wherein at least three positive lenses of the lens group of the third bulge are arranged before the pupil plane.

43. (New) The microlithographic projection lens according to claim 42, wherein the tangential image dishing of the pupil image in the diaphragm space is corrected to less than 15 mm.

44. (New) The microlithographic projection lens according to claim 42, wherein a first negative lens that follows the pupil plane in a beam path is a meniscus that is concave on a pupil side.

45. (New) The microlithographic projection lens according to claim 42, wherein at least one spherically overcorrecting air space is arranged between adjacent lenses in a region of a third bulge behind the pupil plane.

46. (New) The microlithographic projection lens according to claim 42, wherein a lens with an aspheric surface is arranged before a first waist.

47. (New) The microlithographic projection lens according to claim 42, wherein a second waist comprises only spherical lenses.

48. (New) The microlithographic projection lens according to claim 42, wherein quartz glass and fluoride crystals, individually or in combination, are used as lens material.

49. (New) The microlithographic projection lens according to claim 42, wherein the crystals comprise any of CaF_2, BaF_2, SrF_2, LiF.

50. (New) The microlithographic projection lens according to claim 42, comprising two waists and three bulges.

51. (New) A microlithographic projection exposure device comprising a projection lens according to claim 42.

52. (New) A process for producing microstructured components, comprising the steps of:

exposing a substrate provided with a photosensitive layer with ultraviolet light via a mask and a projection exposure device according to claim 42, and

if necessary, after development of the photosensitive layer, the substrate is structured corresponding to a pattern contained on the mask.

53. (New) The process according to claim 52, comprising several exposures with at least one of different kinds of illumination and numerical apertures.

54. (New) A microlithographic projection lens having a system diaphragm arranged in a region of a last bulge on an image side, and having an image-side numerical aperture of more than 0.65 and an image field diameter of more than 20 mm, wherein a pupil plane is curved over a cross section of a pencil of rays by a maximum of 20 mm, wherein a lens with an aspheric surface is arranged before a first waist.

55. (New) A microlithographic projection lens according to claim 54, wherein said pupil plane is curved by a maximum of less than 15 mm.

56. (New) A microlithographic projection lens according to claim 54, wherein a first negative lens that follows the pupil plane in a beam path is a meniscus that is concave on a pupil side.

57. (New) A microlithographic projection lens according to claim 54, wherein a lens group of negative refractive power is arranged at each waist, and a lens group of positive refractive power is arranged at each bulge, and wherein at least two positive lenses of a lens group of a third bulge are arranged before the pupil plane.

58. (New) A microlithographic projection lens according to claim 57, wherein at least three of the positive lenses of the lens group of the third bulge are arranged before the pupil plane.

59. (New) A microlithographic projection lens according to claim 54, wherein at least one spherically overcorrecting air space is arranged between adjacent lenses in a region of a third bulge behind the pupil plane.

60. (New) A microlithographic projection lens according to claim 54, wherein a second waist comprises only spherical lenses.

61. (New) A microlithographic projection lens according to claim 54, wherein quartz glass and fluoride crystals, individually or in combination, are used as lens material.

62. (New) A microlithographic projection lens according to claim 54, wherein the crystals comprise any of CaF_2, BaF_2, SrF_2, LiF.

63. (New) A microlithographic projection lens according to claim 54, comprising two waists and three bulges.

64. . (New) A microlithographic projection exposure device comprising a projection lens according to claim 54.

65. (New) A process for producing microstructured components, comprising the steps of:

exposing a substrate provided with a photosensitive layer with ultraviolet light via a mask and a projection exposure device according to claim 54, and

if necessary, after development of the photosensitive layer, the substrate is structured corresponding to a pattern contained on the mask.

66. (New) The process according to claim 65, comprising several exposures with at least one of different kinds of illumination and numerical apertures.

67. (New) A microlithographic projection lens having a system diaphragm arranged in a region of a last bulge on an image side, and having an image-side numerical aperture of more than 0.65 and an image field diameter of more than 20 mm, wherein the lens has a telecentricity deviation of less than ± 4 mrad of a geometric central beam, on stopping down to 0.8 times said image-side numerical aperture, wherein a lens with an aspheric surface is arranged before a first waist.

68. (New) A microlithographic projection lens according to claim 67, wherein said telecentricity deviation is less than $\pm$ 3 mrad.

69. (New) A microlithographic projection lens according to claim 67, wherein a first negative lens that follows the pupil plane in a beam path is a meniscus that is concave on a pupil side.

70. (New) A microlithographic projection lens according to claim 67, wherein a lens group of negative refractive power is arranged at each waist, and a lens group of positive

refractive power is arranged at each bulge, and wherein at least two positive lenses of a lens group of a third bulge are arranged before the pupil plane.

71. (New) A microlithographic projection lens according to claim 70, wherein at least three of the positive lenses of the lens group of the third bulge are arranged before the pupil plane.

72 (New) A microlithographic projection lens according to claim 67, wherein at least one spherically overcorrecting air space is arranged between adjacent lenses in a region of a third bulge behind the pupil plane.

73 (New) A microlithographic projection lens according to claim 67, wherein a second waist comprises only spherical lenses.

74. (New) A microlithographic projection lens according to claim 67, wherein quartz glass and fluoride crystals, individually or in combination, are used as lens material.

75. (New) A microlithographic projection lens according to claim 67, wherein the crystals comprise any of CaF_2, BaF_2, SrF_2, LiF.

76. (New) A microlithographic projection lens according to claim 67, comprising two waists and three bulges.

77. (New) A microlithographic projection exposure device comprising a projection lens according to claim 67.

78. (New) A process for producing microstructured components, comprising the steps of:

exposing a substrate provided with a photosensitive layer with ultraviolet light via a mask and a projection exposure device according to claim 67, and

if necessary, after development of the photosensitive layer, the substrate is structured corresponding to a pattern contained on the mask.

79. (New) The process according to claim 78, comprising several exposures with at least one of different kinds of illumination and numerical apertures.

80. (New) A microlithographic projection lens having a system diaphragm arranged in a region of a last bulge on an image side, and having an image-side numerical aperture of more than 0.65 and an image field diameter of more than 20 mm, wherein a tangential image dishing of a pupil image in a diaphragm space is corrected to less than 20 mm, wherein a lens with an aspheric surface is arranged before a first waist.

81. (New) A microlithographic projection lens according to claim 80, wherein the tangential image dishing of the pupil image in the diaphragm space is corrected to less than 15 mm.

82. (New) A microlithographic projection lens according to claim 80, wherein a first negative lens that follows the pupil plane in a beam path is a meniscus that is concave on a pupil side.

83. (New) A microlithographic projection lens according to claim 80, wherein a lens group of negative refractive power is arranged at each waist, and a lens group of positive refractive power is arranged at each bulge, and wherein at least two positive lenses of a lens group of a third bulge are arranged before the pupil plane.

84. (New) A microlithographic projection lens according to claim 83, wherein at least three of the positive lenses of the lens group of the third bulge are arranged before the pupil plane.

85. (New) A microlithographic projection lens according to claim 80, wherein at least one spherically overcorrecting air space is arranged between adjacent lenses in a region of a third bulge behind the pupil plane.

86. (New) A microlithographic projection lens according to claim 80, wherein a second waist comprises only spherical lenses.

87. (New) A microlithographic projection lens according to claim 80, wherein quartz glass and fluoride crystals, individually or in combination, are used as lens material.

88. (New) A microlithographic projection lens according to claim 80, wherein the crystals comprise any of CaF_2, BaF_2, SrF_2, LiF.

89. (New) A microlithographic projection lens according to claim 80, comprising two waists and three bulges.

90. (New) A microlithographic projection exposure device comprising a projection lens according to claim 80.

91. (New) A process for producing microstructured components, comprising the steps of:

exposing a substrate provided with a photosensitive layer with ultraviolet light via a mask and a projection exposure device according to claim 80, and

if necessary, after development of the photosensitive layer, the substrate is structured corresponding to a pattern contained on the mask.

92. (New) The process according to claim 91, comprising several exposures with at least one of different kinds of illumination and numerical apertures.